

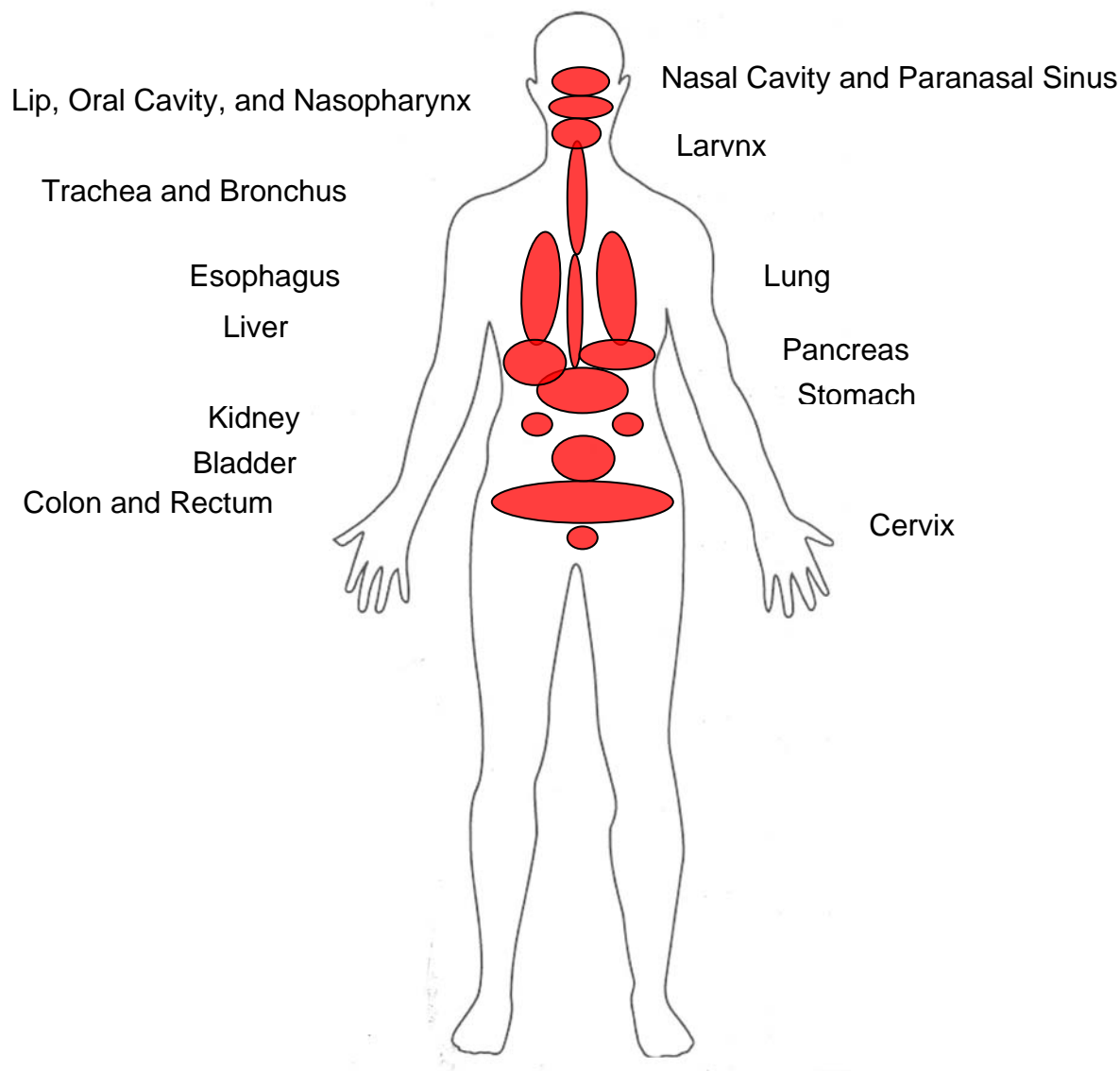
# Tobacco Surveillance Report

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## Smoking and Cancer

Ask what kind of cancer is caused by smoking, and most people will say “Lung.” Some may also mention mouth or throat. In fact, smoking cigarettes causes cancer throughout the body.



The wide variety of cancers attributable to smoking is not surprising. Approximately 3,000 distinct chemicals occur naturally in tobacco leaves and 1,000 more are introduced into

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tobacco products through agricultural practices and post-harvest processing. Fifty-five chemicals in cigarette smoke are established human carcinogens and cigarettes are the major source of exposure to these chemicals for most people.<sup>1</sup>

The table on the facing page shows the increased risk of each type of cancer caused by smoking cigarettes and the proportion of deaths from each type of cancer attributable to smoking. For example, men who smoke are 14 times more likely to develop cancer of the larynx than men who have never smoked, and women who smoke are 13.6 times more likely to develop cancer of the larynx. Eighty-three percent of deaths from cancer of the larynx among men, and 75% among women, are attributable to smoking.<sup>1</sup>

These estimates are based on a critical evaluation of many credible studies. Most studies assessed the relative risks and attributable mortality separately for men and women because male and female smoking patterns have been different for many years. In the United States, cigarette smoking became common among men after 1910, with the marketing of manufactured cigarettes.<sup>2</sup> It was estimated that 46% of US men smoked in 1920, prevalence reached a peak at 65% in 1940, remained stable until the end of the 1950s, then began to decline. Fewer than 5% of US women smoked before 1930 but the prevalence of smoking increased rapidly to a peak of 38% in 1960, then began to decrease. In 2006, smoking prevalence was 22% among men and 18% among women in the US.<sup>3</sup> The prevalence was 17% among Montana men and 16% among Montana women in 2006, down from 26% and 17%, respectively, in 2000.<sup>4</sup>

In addition to being a cause of many cancers, smoking also increases the adverse effects of other carcinogens; this is called a synergistic effect. For example, exposure to asbestos increases the risk of lung cancer much more in smokers than in non-smokers.<sup>5</sup> Synergistic effects of smaller magnitude have also been documented between smoking and arsenic exposure and between smoking and radon exposure for lung cancer; between smoking and alcohol consumption for esophageal cancer; between smoking and human papilloma virus infection for cervical cancer; and among smoking, alcohol consumption, and obesity for liver cancer.

Although cancer at several of the sites listed in the table is also increased by smoking cigars or pipes, or by using smokeless tobacco, estimates of relative risk or attributable mortality are not available for these products. Second-hand smoke exposure also causes cancer but there are limited data to quantify the risk of cancer: Living with a smoker is associated with a 20% to 30% increased risk of developing lung cancer.<sup>6</sup>

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<sup>1</sup> IARC Monographs on the Evaluation of Carcinogenic Risks To Humans. Volume 83. *Tobacco Smoke and Involuntary Smoking*. Lyon, France: World Health Organization, 2004.

<sup>2</sup> W. Weiss. 1997. *Chest* 111:1414-1416.

<sup>3</sup> <http://apps.nccd.cdc.gov/brfss/sex.asp?cat=TU&yr=2006&qkey=4396&state=UB>

<sup>4</sup> Montana Tobacco Use Prevention Program, Department of Public Health and Human Services: *Montana Adult Tobacco Survey 2006*, Helena, MT 2007. Data from the 2000 survey are unpublished but available on request.

<sup>5</sup> Wraith D, Mengersen K. 2007. *Stat Med* 26:1150-1169.

<sup>6</sup> US DPHHS. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. US DPHHS, CDC, Office of Smoking and Health, Atlanta, GA, 2006.

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Table 1. Cancers Caused by Smoking Cigarettes								
		Increased Risk, Odds Ratio			Attributable Mortality, %			Source
		Men	Women	Both	Men	Women	Both	
Respiratory	Larynx	14.0	13.6		83	75		
	Trachea							
	Bronchus	23.3	12.7					IARC, <sup>7</sup>
	Lung <sup>1,2</sup>						90	
Gastrointestinal	Lip <sup>1</sup>							
	Oral cavity <sup>1,3</sup>	10.9	5.1		75	50		IARC
	Nasopharynx <sup>1,3</sup>							
	Esophagus <sup>1</sup>	6.8	7.8		73	57		IARC
	Stomach <sup>1</sup>	2.0	1.4		29	11		IARC
	Pancreas <sup>1</sup>	2.3	2.3		23	24		IARC
Urinary	Kidney	2.7	1.3		39	5		
	Bladder <sup>1</sup>	3.3	2.2		66	30		IARC
Reproductive	Cervix	--	1.6	--	--	12	--	
Hematologic	Acute myeloid leukemia	1.9	1.1		25	11		IARC
1. Smoking pipes and cigars also increases risk. 2. Second-hand smoke exposure is also increases risk. 3. Using smokeless tobacco also increases risk.								

In addition to the cancers listed in Table 1, there is emerging evidence that smoking cigarettes, pipes, and cigars and exposure to second-hand smoke also increase the risk of cancer of the nasal cavity and paranasal sinus, and that smoking cigarettes increases the risk of liver and colorectal cancer.<sup>8</sup> The fraction of the mortality from these cancers attributable to smoking has not yet been established.

<sup>7</sup> IARC Monographs on the Evaluation of Carcinogenic Risks To Humans. Volume 83. *Tobacco Smoke and Involuntary Smoking*. Lyon, France: World Health Organization, 2004.

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There were 1,940 deaths from cancer in Montana in 2006.<sup>8</sup> Using the estimates of the mortality from each kind of cancer attributable to smoking from Table 1, and the mortality from cancer observed in Montana in 2006, more than 600 of those cancer deaths, or nearly one third (32%), might have been associated with smoking (Table 2). This is based on projecting the attributable mortality derived from large studies or meta-analyses to deaths in Montana and should be considered only an approximation. Nevertheless, it shows that smoking cigarettes creates a very large burden of cancer mortality. This burden is entirely avoidable.

Table 2. Estimated Number of Cancer Deaths Attributable to Smoking in Montana 2006						
		Men		Women		Total
		Total Deaths	Attributable to smoking	Total Deaths	Attributable to smoking	
Respiratory	Larynx	3	2.49	2	1.50	3.99
	Trachea Bronchus Lung	287	258.30	237	213.30	471.60
Gastrointestinal	Lip Oral cavity Nasopharynx	18	13.50	7	3.50	17.00
	Esophagus	45	32.85	12	6.84	39.69
	Stomach	21	6.09	11	1.21	7.30
	Pancreas	66	15.18	62	14.88	30.06
Urinary	Kidney	25	9.75	17	0.85	10.60
	Bladder	30	19.80	9	2.70	22.50
Reproductive	Cervix	--	--	10	1.20	1.20
Hematologic	Acute myeloid leukemia	24	6.00	21	2.31	8.31
Total			363.96		248.29	612.25

**Please visit our website at [www.tobaccofree.mt.gov](http://www.tobaccofree.mt.gov)**

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<sup>8</sup> 2006 Montana Vital Statistics, Montana Office of Vital Statistics, January 2008.